

*Claim 1*

1 A method of operating an inspection apparatus to inspect a device used in a manufacturing process, said method comprising the steps of:

scanning the device;

displaying a plurality of images corresponding to respective areas of the

5 device;

selecting at least two of the plurality of displayed images;

deriving a spatial relationship between the selected images; and

forming a pattern to be recognized on the device from the selected

images and the derived spatial relationship.

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2. The method of claim 1 further comprising the step of storing information associated with the selected images and the derived spatial relationship on a computer readable medium of the inspection apparatus.

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3. The method of claim 2 further comprising using said stored selected images and the stored derived spatial relationship in a pattern recognition analysis to detect defects in the device.

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4. The method of claim 2 further comprising using said stored selected images and the stored derived spatial relationship in a pattern recognition analysis to detect desired patterns in the device.

5. The method of claim 1 wherein said selecting step comprises:

displaying at least two image selection windows with the displayed images;  
and  
placing the at least two image selection windows over respective displayed  
images.

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6. The method of claim 5 wherein the image selection windows are  
placed over images corresponding to properly formed areas of the device.

10 7. The method of claim 5 wherein the image selection windows are  
placed over images corresponding to defectively formed areas of the device.

8. The method of claim 5 wherein a user of the apparatus is prompted for  
a number of image selection windows to be displayed.

15 9. The method of claim 1 wherein said selecting step comprises:

displaying an image selection window with the displayed images;  
placing the image selection window over a displayed image;  
determining if another image selection window is required; and  
if another image selection window is required, repeating said steps of

20 displaying an image selection window, placing the image selection window over a  
displayed image and determining if another image selection window is required.

10. The method of claim 9 wherein the image selection windows are  
placed over images corresponding to properly formed areas of the device.

11. The method of claim 9 wherein the image selection windows are placed over images corresponding to defectively formed areas of the device.

5 12. The method of claim 1 wherein the device is a semiconductor wafer.

13. The method of claim 12 wherein the areas are contacts formed in the wafer.

10 14. The method of claim 13 wherein the contact areas have desired and undesired features and said selecting step comprises:

displaying at least two image selection windows with the displayed images; and

15 placing the at least two image selection windows over images associated with the desired features of the contact areas.

15. The method of claim 13 wherein the contact areas have desired and undesired features and said selecting step comprises:

displaying at least two image selection windows with the displayed images; and

placing the at least two image windows over images associated with the undesired features of the contact areas.

16. The method of claim 13 wherein the contact areas have desired and undesired features and said selecting step comprises:

displaying an image selection window with the displayed images;

placing the image selection window over an image associated with the

5 desired feature of a contact area;

determining if another image selection window is required; and

10 if another image selection window is required, repeating said steps of displaying an image selection window, placing the image selection window over an image associated with a desired feature and determining if another image selection window is required.

17. The method of claim 1 wherein the device is a reticle.

18. The method of claim 1 wherein the derived spatial relationship

15 comprises respective spatial relationships between pairs of the selected images.

19. A method of inspecting a semiconductor wafer having objects formed therein, said method comprising the steps of:

scanning the wafer;

20 displaying a plurality of images corresponding to respective areas in the wafer;

selecting at least two of the plurality of displayed images;

deriving a relationship between the selected images; and

forming a pattern to be recognized on the wafer from the selected images and the derived relationship.

20. The method of claim 19 further comprising the step of storing  
5 information associated with the selected images and the derived relationship on a computer readable medium of the inspection apparatus.

21. The method of claim 20 further comprising using said stored selected  
10 images and the stored derived relationship in a pattern recognition analysis to detect defects in the wafer.

22. The method of claim 20 further comprising using said stored selected images and the stored derived relationship in a pattern recognition analysis to detect desired patterns in the wafer.

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23. A method of inspecting a semiconductor device having objects formed therein, said method comprising the steps of:

scanning the device to obtain scanned object images;  
selecting at least two of the scanned object images; and  
20 forming a pattern to be recognized on the device from the selected images and a spatial relationship between the images.

24. An inspection apparatus for use in inspecting a manufacturing device used in a manufacturing process, said apparatus comprising:

a scanning device, said scanning device obtaining images of the manufacturing device;

a display;

an input device; and

5 a processor coupled to said scanning device, said display and said input device, said processor controlling said scanning device to scan the manufacturing device, said processor displaying on said display a plurality of images corresponding to respective areas of the manufacturing device, said processor inputting at least two selected images from the input device, deriving a spatial relationship between the 10 selected images and forming a pattern to be recognized on the manufacturing device from the selected images and the derived spatial relationship.

25. The apparatus of claim 24 further comprising:

a computer readable storage medium coupled to said processor, wherein 15 said processor stores information associated with the selected images and the derived spatial relationship on said computer readable medium.

26. The apparatus of claim 25 wherein said stored selected images and the stored derived spatial relationship are used by the processor in a pattern 20 recognition analysis to detect defects in the manufacturing device.

27. The apparatus of claim 25 wherein said stored selected images and the stored derived spatial relationship are used by the processor in a pattern recognition analysis to detect desired patterns in the manufacturing device.

28. The apparatus of claim 24 wherein said processor inputs selected images by displaying on said display at least two image selection windows with the displayed images and inputs data corresponding to images selected by the selection windows via said input device.

29. The apparatus of claim 28 wherein a user of the apparatus is prompted for a number of images windows to be displayed.

10 30. The apparatus of claim 24 wherein said processor inputs selected images by displaying an image selection window on said display with the displayed images, inputs data corresponding to images selected by the image selection window via said input device, determines if another image selection window is required, and if another image selection window is required, continues to display an image selection window, input data and determines if another window is required until no further windows are required.

15 20 31. The apparatus of claim 24 wherein the manufacturing device is a semiconductor wafer.

32. The apparatus of claim 31 wherein the areas are contact areas formed in the wafer.

33. The apparatus of claim 24 wherein the manufacturing device is a reticle.

34. The apparatus of claim 24 wherein the derived spatial relationship 5 comprises respective spatial relationships between pairs of the selected images.

35. An inspection apparatus for use in inspecting a semiconductor wafer, said apparatus comprising:

10 a scanning device, said scanning device obtaining images of a wafer;

a display;

an input device; and

15 a processor coupled to said scanning device, said display and said input device, said processor controlling said scanning device to scan a wafer, said processor displaying on said display a plurality of images corresponding to areas of the scanned wafer, said processor inputting at least two selected images from the input device, deriving a relationship between the selected images and forming a pattern to be recognized on the scanned wafer from the selected images and the derived relationship.

20 36. The apparatus of claim 35 further comprising:

a computer readable storage medium coupled to said processor, wherein said processor stores information associated with the selected images and the derived relationship on said computer readable medium.

37. The apparatus of claim 36 wherein said stored selected images and the stored derived relationship are used by the processor in a pattern recognition analysis to detect defects in the scanned wafer.

5 38. The apparatus of claim 36 wherein said stored selected images and the stored derived relationship are used by the processor in a pattern recognition analysis to detect desired patterns in the scanned wafer.

39. An inspection apparatus for use in inspecting a semiconductor wafer,  
10 said apparatus comprising:  
a scanning device, said scanning device obtaining images of a wafer;  
an input device; and  
a processor coupled to said scanning device and said input device, said  
processor controlling said scanning device to scan a wafer, said processor inputting at  
15 least two selected images from the input device and forming a pattern to be  
recognized on the scanned wafer from the selected images and a spatial relationship  
between the images.